

AMENDMENT

IN THE CLAIMS:

1. (Currently Amended) ~~A transgenic potato plant cell which is genetically modified, the genetic modification leading to a decrease in the activity of one or more granule-bound starch synthase I (GBSSI) proteins occurring endogenously in the potato plant cell and to a decrease in the activity of one or more branching enzyme I (BEI) proteins occurring endogenously in the potato plant cell, in comparison to corresponding non-genetically modified potato plant cells of wild type plants, wherein said genetic modification comprises the introduction of one or more foreign nucleic acid molecules, in which said foreign nucleic acid molecules are selected from the group consisting of:~~

~~(a) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins;~~  
~~and~~

~~(b) DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins.~~

A transgenic potato plant cell which is genetically modified, the genetic modification leading to a decrease in the activity of one or more granule-bound starch synthase I (GBSSI) proteins occurring endogenously in the plant cell and to a decrease in the activity of one or more branching enzyme I (BE I) proteins occurring endogenously in the plant cell, in comparison to corresponding non genetically modified plant cells of wild type plants, wherein said genetic modification comprises the introduction of one foreign nucleic acid molecule, in which said foreign nucleic acid molecule is selected from the group consisting of

- (a) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;
- (b) DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;
- (c) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and
- (d) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins.

2. (Currently Amended). ~~The transgenic plant as claimed in claim 1, the genetic modification consisting in the introduction of one or more foreign nucleic acid molecules, whose presence and/or expression leads to a decrease in the activity of GBSSI and BE proteins, in comparison to corresponding non genetically modified plant cells of wild type plants~~

A transgenic potato plant cell which is genetically modified, the genetic modification leading to a decrease in the activity of one or more granule-bound starch synthase I (GBSSI) proteins occurring endogenously in the plant cell and to a decrease in the activity of one or more branching enzyme I (BE I) proteins occurring endogenously in the plant cell, in comparison to corresponding non genetically modified plant cells of wild type plants, wherein said genetic

modification comprising the introduction of two foreign nucleic acid molecules, in which said two foreign nucleic acid molecules are selected from the group consisting of :

- (a) one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BE proteins;
- (b) one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which lead, via cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins;
- (c) one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and
- (d) one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins.

- 3. (Cancelled).
- 4. (Cancelled).
- 5. (Cancelled).
- 6. (Cancelled).

7. (Currently Amended) The transgenic potato plant cell as claimed in ~~claim 6~~ claims 1 or 2, which synthesizes a modified starch having an amylopectin content of at least 90% and in comparison to starch from plant cells of corresponding potato plants of the waxy phenotype having an increased phosphate content.

8. (Currently Amended) ~~A process for the production of a transgenic potato plant cell which synthesizes a modified starch, in which a potato plant cell is genetically modified by the introduction of one or more foreign nucleic acid molecules, wherein the presence and/or expression of the one or more foreign nucleic acid molecules leads to a decrease in the activity of at least one GBSSI protein and to a decrease in the activity of at least one BEI protein, in which said foreign nucleic acid molecules are selected from the group consisting of:~~

~~(a) — DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins; and~~

~~(b) — DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins~~

A process for a production of a transgenic potato plant cell which synthesizes a modified starch, in which a potato plant cell is genetically modified by the introduction of one foreign nucleic acid molecule, wherein the presence and/or expression of the foreign nucleic acid molecule leads to a decrease in the activity of at least one GBSSI protein and to a decrease in the activity of at least one BEI protein, in which said foreign nucleic acid molecule is selected from the group consisting of:

- (a) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;
  - (b) DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;
  - (c) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and
  - (d) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins.
9. (Previously Presented) A process according to claim 8, wherein the modified potato starch has an amylopectin content of at least 90% and an increased phosphate content in comparison to starch from corresponding potato plants of the waxy phenotype.
10. (Currently Amended) ~~A process for the production of a transgenic potato plant which synthesizes a modified starch, in which:~~
- ~~(a) a potato plant cell is genetically modified by the introduction of one or more foreign nucleic acid molecules wherein the presence and/or expression of the one or more foreign nucleic acid molecules leads to a decrease in the activity of at least one GBSSI protein and to a decrease in the activity of at least one BEI protein, wherein said nucleic acid molecules are selected from the group consisting of~~

- ~~(i) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins and~~
- ~~(ii) DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and/or BEI proteins;~~
- ~~(b) a potato plant is regenerated from the cell produced according to step a); and,~~
- ~~(c) if appropriate, further potato plants are produced from the plants produced according to step b)~~

A process for the production of a transgenic potato plant which synthesizes a modified starch, wherein:

(a) a potato plant cell is genetically modified by the introduction of one foreign nucleic acid molecules wherein the presence and/or expression of the foreign nucleic acid molecule leads to a decrease in the activity of at least one GBSSI protein and to a decrease in the activity of at least one BEI protein; in which said nucleic acid molecules are selected from the group consisting of:

- (i) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;
- (ii) DNA molecules which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and BE proteins;

(iii) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and

(iv) DNA molecules which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins;

(b) a potato plant is regenerated from the cell according to step a); and

(c) optionally, further potato plants are produced from the plants produced according to step b).

11. (Previously Presented) The process according to claim 10, wherein the modified potato starch has an amylopectin content of at least 90% and an increased phosphate content in comparison to starch from corresponding potato plants of the waxy phenotype.

12. (Currently Amended) A transgenic potato plant ~~containing~~ comprising potato plant cells as claimed in ~~claim 1~~ claims 1 or 2.

13. (Cancelled).

14. (Cancelled).

15. (Currently Amended) A reproductive material of a potato plant as claimed in claim 12, ~~containing~~ comprising potato plant cells as claimed in ~~claim 1~~ claims 1 or 2.

16. (Cancelled).

17. (Cancelled).

18. (Cancelled).

19. (Currently Amended) A composition ~~containing~~ comprising at least one of the nucleic acid molecules as defined in ~~claim 1~~ claims 1 or 2, which is suitable for the production of transgenic potato plant cells as claimed in ~~claim 1~~ claims 1 or 2, the presence of said nucleic acid molecules in said potato plant cells leading to a decrease in the activity of GBSSI proteins occurring endogenously in the potato plant cell and to a decrease in the activity of BEI proteins occurring endogenously in the potato plant cell.

20. (Cancelled).

21. (Cancelled).

22. (Previously Presented) The composition as claimed in claim 19, the nucleic acid molecule(s) being contained in a recombinant nucleic acid molecule.

23. (Previously Presented) A host cell containing a composition as claimed in claims 19.

24. (Previously Presented) A transgenic potato plant cell containing a composition as claimed in claim 19.

25. (Cancelled).

26. (Cancelled).

27. (Cancelled).

28. (Cancelled).

29. (Previously Presented) A process for the production of a modified potato starch from a transgenic potato plant, comprising extracting the starch from the potato plant according to claim 12.

30. (Cancelled).



31. (Previously Presented) The process of claim 29, wherein the modified potato starch has an amylopectin content of at least 90% and an increased phosphate content in comparison with starch from corresponding potato plants of the waxy phenotype.

32. (Cancelled).

33. (Previously Presented) The process of claim 31, wherein the modified potato starch has a decreased gelatinization temperature in comparison with starch from corresponding potato plants of the waxy phenotype.

34. (New) A process for the production of a transgenic potato plant cell which synthesizes a modified starch, in which a potato plant cell is genetically modified by the introduction of two foreign nucleic acid molecules, wherein the presence and/or expression of the foreign nucleic acid molecules lead to a decrease in the activity of at least one GBSSI protein and to a decrease in the activity of at least one BEI protein, in which said foreign nucleic acid molecules are selected from the group consisting of:

- (a) one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BE proteins;
- (b) one DNA molecule, which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins;
- (c) One DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA

molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and

- (d) One DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins.

35. (New) The process according to claim 34, wherein the modified potato starch has an amylopectin content of at least 90% and an increased phosphate content in comparison to starch from corresponding potato plants of the waxy phenotype.

36. (New) A process for the production of a transgenic potato plant which synthesizes a modified starch, in which:

- (a) a potato plant cell is genetically modified by the introduction of two foreign nucleic acid molecules wherein the presence and/or expression of the foreign nucleic acid molecule leads to a decrease in the activity of at least one GBSSI protein and to decrease in the activity of at least one BEI protein; in which said nucleic acid molecules are selected from the group consisting of:

- (i) one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BE proteins;
- (ii) one DNA molecule, which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI

and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins;

- (iii) One DNA molecule which encodes at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding GBSSI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding BE proteins; and
- (iv) One DNA molecule which encode at least one antisense RNA which brings about a decrease in the expression of endogenous genes encoding BEI and one DNA molecule which lead, via a cosuppression effect, to a decrease in the expression of endogenous genes encoding GBSSI proteins;

(b) a potato plant is regenerated from the cell produced according to step a); and,

(c) optionally, further potato plants are produced from the plants produced according to step b).

37. (New) A process according to claim 36, wherein the modified potato starch has an amylopectin content of at least 90% and an increased phosphate content in comparison to starch from corresponding potato plants of the waxy phenotype.